

# HEADLEY

REG. U.S. PAT. OFF

# ASPHALT-BASE

# ALUMINUM COATING

# Bulletin

430

PROTECTIVE MATERIALS CO.  
1600 CLARK AVENUE,  
GARFIELD 3900. ST. LOUIS, MO.

# *Asphalt-Base* **ALUMINUM**

P. 1  
A.I.A. File No. 25-B-27

## **Engineering Service to Utility, Railroad and Public Officials, Architects, Consulting Engineers, Contractors, Builders, Plant Managers and Purchasing Agents**

**I**NASMUCH as we aim to furnish only wholly suitable material, and conditions which are new or new to the customer are constantly arising, we maintain an able Technical Staff available for free consultation and prompt co-operation on all problems involving the use of emulsified asphalts.

We urge that our advice be sought wherever doubt exists as to which of our products should be chosen and how the application should be made for best results.

Specifications covering efficient, economical adaptations under standard conditions will be sent on request. Reports, plans, suggestions and specifications covering work requiring investigation will be prepared and furnished as quickly as necessary determinations can be made.

If you wish to know exactly what Headley Asphalt-base Aluminum Coating and Headley Emulsified Asphalts have done and will do under conditions similar to your own, or if you desire reliable information on any detail of possible new development, let us have your inquiry.

### **HEADLEY EMULSIFIED PRODUCTS CO.**

During his five-year supervision of the Roofing Research Laboratory, Pittsburgh, Mr. Ross made extensive studies of asphalts and other materials to determine their adaptability and efficiency for roofing, general waterproofing and protective coating purposes. These studies were basic and accompanied by long-time outside weathering and service tests in conjunction with related accelerated tests. In this work, original methods developed by Mr. Ross produced much new information about asphalts and their adaptability to various uses.

As Technical Director for Headley Emulsified Products Company and its predecessor, Headley Good Roads Company, Mr. Ross has had exceptional opportunity to continue intensive effort along the same lines and his experience and accumulated knowledge in this field have been recognized by appointment to membership on three committees (Preservative Coatings, Road Materials, and Waterproofings and Roofings) of the American Society for Testing Materials. He was recently chosen as a member of the committee for the Chicago World's Exposition 1933, to draw up a presentation of the history of asphalt and its contribution to science and technology during the past century.

### **HEADLEY EMULSIFIED PRODUCTS COMPANY Franklin Trust Building, Philadelphia**

**Branch Office: One LaSalle Street Building, Chicago      Works: Marcus Hook, Pa.**



**EDGAR S. ROSS**  
*President and Technical Director*  
Headley Emulsified Products Company

Chemical Engineer and Industrial Chemist  
Member: Am. Inst. of Chemical Engrs.; Am. Chemical Soc.; Am. Electrochemical Soc.; Am. Soc. for Testing Materials; Internat. Soc. for Testing Materials; Assn. of Asphalt Paving Technologists; Am. Assn. for the Advancement of Science; Franklin Inst. of Phila.

**M**MR. ROSS is widely experienced and thoroughly informed on the following:—asphalts, bituminous and asbestos roofings, waterproofings, structural products, paints and paving materials.

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**H**EADLEY Asphalt-base Aluminum is a coating composition for application over steel, iron and other metals, concrete, wood and fabric for the prevention of corrosion, disintegration and destruction from the action of moisture, acids or alkalies, chemical fumes, salt air, etc., for which service it is characterized by ease of application and maximum protection at minimum cost.

The ingredients are aluminum flake and pure refined Mexican asphalt with only enough volatile solvent to produce a good brushing or spraying consistency. On application, the solvent evaporates leaving a uniform continuous deposit of asphalt covered with a continuous armor coat of metallic aluminum. The quantity of aluminum is sufficient to thoroughly cover the asphalt and insure maximum durability.

The aluminum is prepared by a stamping process which forms minute flat flakes, instead of the granules ordinarily obtained by grinding. In the finishing operation, the flakes are given a brilliant lustrous surface by polishing.

**Double protection, asphalt under an aluminum armor, at one application**

**T**HE thin film of the solvent-repelling polishing agent which remains on the finished aluminum flakes causes them to work their way to the upper surface of the applied coating before the asphalt begins to set up, and there to adjust themselves on top of each other into numerous flat layers forming a continuous interlocked armor coat.

This bright and impervious metallic outer coating forms an exterior seal against moisture and chemical attack and protects the substantial underlying layer of asphalt from destructive influences. The asphalt penetrates into open pores of the base, metal, concrete, wood or fabric and remains as a permanent highly adhesive binder. In service, the light- and heat-reflecting aluminum surface shields the asphalt against deterioration from solar energy, and the asphalt and aluminum together give the same double protection to the base as though a waterproofing medium and an ordinary paint had been applied separately.

**Ideal protection against corrosion and disintegration**

**I**NASMUCH as refined Mexican asphalt and aluminum are both highly resistant to weather and atmospheric conditions, Headley Asphalt-base Aluminum Coating affords adequate protection to exposures of various kinds. The finished coating is impervious and adhesive, and is thoroughly effective as a primer over metal bases, as a combined priming and finishing coat or as an armor coat between asphaltic surfaces and oil paints. Galvanized iron takes Headley Asphalt-base Aluminum without preliminary surface treatment, and the life of the metal is greatly prolonged, especially where exposed to moisture, salt air, industrial fumes, etc. As protection for concrete or masonry, Headley Asphalt-base Aluminum Coating is highly effective. On wood surfaces, the asphalt and the aluminum combine into an effective seal over knots and over the open pores of the cellular structure. The coating sets up as smoothly and as free from thin and dull spots as on metal, and retains the necessary elasticity to stand the high degree of expansion and contraction without cracking or peeling. Wood coated with Headley Asphalt-base Aluminum has maximum protection against swelling, cracking, warping and decay from the entrance of moisture.

**A technical combination of effective ingredients**

**H**EADLEY Asphalt-base Aluminum Coating is a noteworthy technical achievement. It is shipped ready mixed, and can be stored without the aluminum losing its bright lustre and its leafing qualities. Standardizing on this one material, with ingredients properly selected and compounded, will insure the maximum degree of service and satisfaction.

The consistency of Headley Asphalt-base Aluminum Coating is the same for either spraying or brushing. Nothing need be added to regulate the setting, elasticity or hardness of the applied coating. The drying is complete within an hour or two, even in cold weather. In contrast, oil-base

aluminum preparations may require thinning for spray applications or the addition of dryers under certain conditions. Thinner may cause thin spots or running on vertical surfaces, and dryers may render the coating brittle. Any thinning or drying ingredients in the vehicle reduce the proportion of efficient preservative material in finished coating of given thickness.

**Almost universal in outside and inside application and usefulness**

**T**HE use of Headley Asphalt-base Aluminum Coating is highly advantageous because of its easy working qualities on warm or cold surfaces, its almost universal range of application and comparatively low cost. As an exterior coating, it meets all conditions of exposure, providing lasting protection under unfavorable conditions, with one application and at very low cost consistent with maximum efficiency. As an interior coating, considering utility and service, and figuring on first cost plus upkeep, it is much less expensive than lower priced materials.

As aluminum does not stain or change its color materially from oxidation and as the smooth surface of the coating repels deposits of foreign matter, the initial freshness of the finished job is retained remarkably well. Wind and rain usually loosen and remove any surface accumulation in exterior applications, and wiping or washing to restore surface freshness of interior applications does not impair the protective qualities.

**A superior primer under tinted oil paint**

**T**HE penetrating, bonding and lasting qualities of refined asphalt are generally conceded to excel those of any other proofing material. The smoothness and density of the aluminum outer surface provide a perfect base for an outer pigment coat. The opacity and imperviousness of both the asphalt and the aluminum prevent the bleeding through of stains and colored spots from underlying coats. The combination as a covering over old paint, as a bonding element, as a seal against penetration of moisture or fumes, and as a lasting protec-

tion against deterioration of the base material is therefore hard to equal.

One priming coat covers a dark base, even if dead black, to a uniform light tint, and the absence of streaks or thin spots permits one top coat of light or medium tinted oil paint to cover as completely as two over an oil primer.

A priming coat of Headley Asphalt-base Aluminum under a top coat of oil paint lengthens the useful life of the oil paint by providing an enduring foundation bond. Headley Asphalt-base Aluminum Coating is in reality the protective coating, the oil and pigment paint merely providing color.

In preparing for a finish of white enamel, or conversion of any dark surface to a lighter one, a priming coat of Headley Asphalt-base Aluminum Coating removes all evidence of previous surface stains.

In changing over the design and lettering of old signs, priming with Headley Asphalt-base Aluminum Coating provides a perfect base for the new pigment paints and completely obliterates the old.



Convenient to handle. Headley Asphalt-base Aluminum Coating weighs  $8\frac{1}{2}$  lb. per gal. as compared to from 18 to 23 lb. for lead paints. The workman can therefore carry a larger quantity wherever he goes, loses less time in getting renewal supplies and therefore gets more surface coated in a working day.

**Advantages of high reflectivity**

**H**HEADLEY Asphalt - base Aluminum Coating reflects over 70 per cent of the light rays that fall upon its surface—as high a percentage as that of most white paints. Its high heat-wave reflectivity is also of considerable utility.

**Exterior applications:**—In connection with the superior protective and preservative qualities, the silvery sheen makes an attractive finish for fire hydrants, street lamps and signal standards and certain classes of roofs, as well as for permanently exposed structural steel, antenna and transmission line towers, tanks, silos, fences, etc.

At night, bridge approaches, warning signs at railway crossings, road direction signs, traffic standards, side fences, and other safety devices, with this light reflecting surface stand out in bolder relief than if painted in any other color. For the same reasons, airway direction signs are visible to best advantage both day and night.

In natural gas regions, around oil refineries and in other locations where the atmosphere is laden with sulphur fumes, Headley Asphalt-base Aluminum Coating does not darken, as do lead pigment paints.

**Interior applications:**—Interior factory and warehouse walls, passages, dark tunnels, vaults, etc., where conditions require maximum lighting efficiency, should be coated with Headley Asphalt-base Aluminum. Only one coat is required. Dirt adheres less readily and can be removed easier than from ordinary painted surfaces. Cleaning by brushing, washing or vacuum is simple and effective.

The improvement in illuminating efficiency in ordinary buildings by treating the walls with Headley Asphalt-base Aluminum Coating is indicated by a reduction of 33½ per cent in watt capacity of bulbs or an increase of 50 per cent in lighting efficiency with the same bulb capacity.

**As a non-conductor of heat**

**A**N aluminum-coated surface has a higher reflectivity of the infra-red or solar heat waves than of the visible light, and its re-

sistance to emissivity or radiation are also high. Together the aluminum and the asphalt are refractory to 90 per cent or more of the sun rays which are so destructive to exposed ordinary paints. Because Headley Asphalt-base Aluminum Coating reflects so much, and absorbs and conducts so little radiant energy, it forms very effective insulation against heat transfer.

As a coating for exterior surfaces exposed to intense summer sunlight, Headley Asphalt-base Aluminum is an appreciable factor in lowering inside temperature.

The upper floors of buildings having metal roofs covered with this material remain about 20 deg. cooler during the day. This is a decided summer advantage in cold storage plants, ice cream plants, dairies, and wherever perishables are unfavorably affected by heat.

**Temperature reduction in storage tanks or compartments**

**S**OLAR radiation on an intensely bright day can impart 4 or 5 B.t.u. per min. to every square foot of surface on which sun rays fall. This amount of heat transmitted to the interior of even a small tank in certain kinds of service is decidedly objectionable during periods of intense sunlight, in that it may impair quality of contents through chemical change, and evaporation losses of water and volatile fluids, and expansion of the confined gases, cause either harmful expansion strains or escape of the more volatile elements through "breathers" during warm periods with subsequent infiltration of air on cooling.

An outside coating of Headley Asphalt-base Aluminum is therefore particularly desirable for storage tanks, water, chemicals, solvents, oils and gas tanks, and refrigerator cars, exposed refrigerating and cold-storage compartments, etc.

In connection with efforts to minimize losses in the handling of crude oils, certain governmental agencies made tests upon four oil-filled storage tanks, coated respectively with aluminum, gray pigment, red pigment and black pigment paints, identical in all respects but the pigment. In one year's

time, the evaporation losses were 22 per cent greater with gray, 36 per cent greater with red, and 45 per cent greater with black coating than with the aluminum coating. Not only had the aluminum coating saved many barrels of oil, but through smaller evaporation of the less volatile fractions, the remaining bulk was found to be in a better state of preservation, the loss in gravity being at least 0.4 deg. A.P.I. Standard, less than in the black-coated tank. Gravity losses underneath pigments of the other colors ranged approximately in proportion to the evaporation losses.

The preservation of quantity and quality of contents of the aluminum-covered tank easily repaid the cost of coating the tank, to say nothing of the prolongation of useful life of the metal.

#### Airship applications

As a waterproofing and seal coat for the fabric of gas containers of lighter-than-air craft and the fuselage and wing covering of heavier-than-air machines, Headley Asphalt-base Aluminum closes the pores of the fabric completely and produces a smooth outer coating which has high anti-friction quality. The opacity and high light- and heat-reflective value of this coating greatly increase the useful life of the fabric and its impregnating compounds by arresting deterioration during idle periods in intense sunlight. The fact that the coating does actually keep the fabric cooler and checks transmission of much radiant heat to the contents of a balloon or gas container reduces leakage of the gas and is added protection against over-expansion during the warm periods. The importance of such control is evident from the temperature of 117 deg. fahr. maintained inside an aluminum-coated fabric, where under identical conditions except for an oil-pigment outer coating, the temperature reached 147 deg. In all the above respects coating with Headley Asphalt-base Aluminum will be found far more efficient and far more economical than coating with various oils.

Coating and waterproofing aircraft propellers with Headley Asphalt-base Alu-

minum affords protection against splitting of the wood under sudden temperature change, and from weakening of glue in the bond between the laminations.

#### Securing tinted effects

HEADLEY Asphalt-base Aluminum Coating, being made for maximum protection, contains only elements which do useful work. Color effects are therefore not attempted to any great extent, but a few, which have been found practical and without impairment of protective efficiency are available. If tint requirements are submitted, the Technical Staff of the Company will advise to the customer's best interests.



Standard packages. 50-gal. and 30-gal. metal drums and 5-gal. and 1-gal. metal pails. 1-Gal. tin containers packed six in a case are available, but not recommended on account of extra bulk of the outer cases, greater risk of leakage, higher transportation charges and higher cost per gallon.

### Tests of waterproofing effect of aluminum coatings

**E**XHAUSTIVE tests conducted independently by several large laboratories have established waterproofing efficiencies for aluminum coatings over wood ranging from 91 per cent to 98 per cent. The test results for determining moisture resistance

of coatings for wood have shown asphalt-base aluminum and pitch-base aluminum to be the most efficient coatings. Headley Asphalt-base Aluminum Coating combines all of the advantageous properties of high-grade waterproofing asphalt and the well-known protective properties of aluminum coatings.

### Specifications for Headley Asphalt-base Aluminum Coating

**A SPHALT-BASE Aluminum:** — The aluminum shall consist of stamped and polished aluminum flakes, the largest of which can pass through a 100-mesh screen. The base shall consist of pure refined Mexican petroleum asphalt comprising not less than 45 per cent of the total by weight and dissolved with volatile solvent that will evaporate completely on application. The composition shall contain no filler, adulterants, linseed or other free vegetable oil.

**Preparation of surface:** — The surface shall be thoroughly dry and clean before applying the coating. All loose particles of scale, rust, dirt, old paint, etc., are to be removed by wire brushing or other suitable means. Bare steel or iron shall be suitably primed and steel with mill coat shall have all bare spots touched up.

**Application:** — Application may be by

### General instructions for applying

**Caution:** — The volatile solvent in Headley Asphalt-base Aluminum is flammable. Containers in storage or use should be kept away from fire, and freshly coated interior surfaces should be well ventilated to speed drying and to carry off the fumes as fast as liberated. These simple precautions will avoid fire hazard.

**T**HE suggestions following and elsewhere in this booklet cover the typical applications and are in accordance with widely approved engineering practice. The methods have been tested and proven by this Company's Technical Staff, and if carefully followed will assure efficient, economical and long-time satisfactory service.

No experience is required as the material

brushing but spraying is recommended. Avoid excessive brushing. Usual spraying precautions must be exercised. No exterior coating shall be done in wet or freezing weather. Coverage shall be at the rate of  $\frac{1}{4}$  to 1 gal. per 100 sq. ft., depending on nature of work and results desired.

**Number of coats:** — One coat of asphalt-base aluminum shall be applied over the priming coat (new work) or over the old paint. Raw, open-grained and badly weathered wood with exterior exposure, and concrete and masonry with very porous surface shall have an under coat of Headley Emulsified Asphalt with the finish coat of Headley Asphalt-base Aluminum.

**NOTE:** — Where an extra heavy residue of asphalt is desired under any severe conditions, Headley Emulsified Asphalt No. 11 should be used as the primer.

### Headley Asphalt-base Aluminum

comes ready for use, spreads readily into as thin a coat as desired and sets up firmly. The ease and speed of application will be an agreeable surprise to those accustomed to using aluminum coatings with other types of vehicle.

**Brushing:** — The coating should be applied quickly, with minimum brushing, and all final brush strokes from the top downward.

Brushes, both before and after using, should be washed out thoroughly with some suitable solvent, such as gasoline, benzine or naphtha.

During use, no sand or dirt should be permitted to remain in the brush. If foreign

matter cannot be removed otherwise, thorough cleaning should be resorted to as described elsewhere.

**Spraying:**—Spraying saves both time and labor and permits rapid and uniform application to any desired thickness. This is the recommended method of application, especially for coating very rough or porous surfaces, for getting into corners and crevices that cannot well be reached by brushing, and for greatest economy on large jobs. One man can spray about 2000 sq. ft. per hr. with better penetration than by brushing, and as there is no dripping, no material is wasted.

A number of standard spray outfits, especially of the syphon type have been found suitable and if used in accordance with the manufacturer's instructions, will spray Headley Asphalt-base Aluminum Coating satisfactorily. Owing to the high asphalt content, 60-lb. air pressure at the gun is suggested. This will shoot a strong spray with penetrating effect equal to that of two brushed coats. A regulator on the suction lead controls density and coverage power of the coating.

Wherever and whenever conditions permit, the container should be placed at higher elevation than the gun in order that gravity may assist the syphoning action. This will permit better flow of the material, and will permit the length of the suction hose to be increased.

Irregular flow of the asphalt-base aluminum coating can be prevented by keeping the interior of the suction line and gun clean. After use, the gun and suction line should be blown with gasoline, washed off outside and the valve stem oiled.

**Stirring insures perfect distribution:**—Before removal from the drum the contents should be stirred thoroughly with any suitable device. After that the material may be poured into small buckets for more convenient handling and should be kept well mixed by further stirring.

**Preventing thickening in the container:**—Covers must be fitted tightly to containers when not in use, as free circulation of air

permits evaporation of the solvent and causes the product to thicken.

**Thinning:**—No appreciable thickening occurs if the container is kept sealed while not in use, and thinning is seldom necessary for either brush or spray application. Where thinning does become desirable on account of partial evaporation of the solvent, a small amount of gasoline, benzine or naphtha may be added and stirred in thoroughly.

**Preparation of surface to receive the coating:**—Headley Asphalt-base Aluminum Coating may be applied to raw surface or over a coating of any other material. The surface to be treated must be free from dust, sand, mud, mortar, scale, rust and other loose particles and oil. All large holes or cracks must be thoroughly conditioned. Rough projections should be removed. Sweeping carefully with fibre or wire brush, or air blasting will generally suffice, but loose particles of previous coatings should be scraped off. Obstinate mill scale on ferrous metals can be loosened by vibrations from an air hammer. Oil spots may be removed by washing with a rag dipped in gasoline, benzine, naphtha or soda. Bare spots in old primer or paint should be reprimed before applying the asphalt-base aluminum coating.

The surface or the priming coat must be thoroughly dry to produce a good bond.

**Applying in cold or wet weather:**—Coating operations generally should not be attempted at temperatures below freezing. With Headley Asphalt-base Aluminum Coating, the bond would not be impaired, but the time required for setting is increased. In case of a sudden rain after rising temperature, the upper part of a coating which has not set might streak, move or partially wash away. For the same reasons, exterior application should not be undertaken when rain is threatened. Drops striking upon the coating before it has set might mar the surface.

**Number of coats:**—Provided the surface to be treated is in good condition, a single coat of Headley Asphalt-base Aluminum is sufficient as a priming or a finishing coat. Where an exceptionally heavy

asphalt residue is desirable, as over very porous concrete or badly weathered wood, application over a priming coat of Headley Emulsified Asphalt No. 11 (See Page 12) is recommended. Headley Asphalt-base Aluminum Coating should be applied as a finishing coat only after new primer has dried. Used as a primer, it must dry before covering with the finishing coat. Setting is usually complete in 1 hr. after application.

**Coverage:**—The coverage rate should be adapted to the smoothness, porosity and other characteristics of the base, the purpose for which the coating is desired, and the severity of the exposure.

The possible coverage is about as follows:—Smooth metal base, 400 sq. ft. per gal.; Concrete base, 100 sq. ft. per gal.; Wood base, 150 to 200 sq. ft. per gal. These rates can be maintained without difficulty.

## Headley Asphaltic Products

For general dampproofing, waterproofing and protective coating purposes  
**Headley Emulsified Asphalt No. 10**      **Headley Emulsified Asphalt No. 11**  
**Headley Emulsified Asphalt No. 12 (Plaster bond)**

For heavy coating and cementing purposes  
**Headley Emulsified Asphalt No. 10A**

*Shipped in 50-55-gal. metal drums and 5-gal. metal pails*

Paving binders for traffic-bearing surfaces of highways, city streets, railroad grade crossings, station platforms, etc.

**Headley Emulsified Asphalt No. 1 and No. 6. For summer application**  
**Headley Emulsified Asphalt No. 2 (Viafalt). For winter application**  
*Shipped in 50-55-gal. metal drums*

For marking traffic zone lines on streets and highways  
**Headley Zone-marking Emulsified Asphalt No. 5**  
*Shipped in 50-55-gal. metal drums and 5-gal. metal pails*

For membrane waterproofing  
**Headley Saturated Cotton Fabric No. 90**  
*Shipped in 58-*yd.* rolls of 34-in. to 36-in. width*

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### **Headley Asphalt-base Aluminum Coating No. 30**

*Shipped in 50-55-gal. metal drums and 5-gal. and 1-gal. metal pails*

Headley Asphalt Products meet standard engineering specifications, and  
are adaptable for classes of service indicated on the following pages.

## Typical Applications of HEADLEY ASPHALTIC PRODUCTS

<b>Damproofing</b>			
Abutments	Coal breakers	Floors	Piers
Aqueducts	Coal bunkers	new construction and maintenance	Pipe coverings
Barges	Concrete pipe	Foundations	Protection of heat insulation
Basements	Concrete structures all types	Greenhouses	Refrigerators
Boat decks	Dairies	Gymnasiums	Reservoirs
Boiler pits	Dams	Industrial plants	Sea walls
Bridge decks	Elevator pits	Light shafts	Sewer pipe
Buildings	Fibrous insulating boards	Parapet walls	Ship bottoms
Cisterns			
<b>Waterproofing</b>			
Abutments	Concrete structures all types	Foundations	Reservoirs
Aqueducts	Dams	Industrial plants	Subways
Basements	Dye houses	Parapet walls	Swimming pools
Bridges	Fibrous insulating boards	Piers	Train sheds
Buildings	Floors new construction maintenance	Pipe coverings	Tunnels
Cisterns		Protection of heat insulation	Turbine pits
Coal bunkers		Refrigerators	Vats
Concrete pipes			Vaults
			Viaducts
<b>Protective Coatings</b>			
Abutments	Damproofing	Molasses plants	Protection of heat insulation
Acid and alkali protection	Dams	Mortar	Steel mills
Aqueducts	Dye houses	Nitrating plants	Stone backing
Barges	Electro-plating plants	Ore reduction plants	Stone joints
Basements	Elevator pits	Packing plants	Storage battery
Battery box coatings	Explosives plants	Paper mills	plants
Bleacheries	Fence posts	Parapet walls	Structural steel
Boat decks	Fertilizer plants	Penstocks	Stucco
Boiler pits	Fibrous insulating boards	Pickling plants	Subways
Brick	Floors	Piers	Sugar refineries
Bridges metal and concrete work	Foundations	Pipe coverings	Swimming pools
Brine tanks	Foundries	Pipe lines	Tanks
Buildings	Fruit canneries	oil and gas metal or concrete	Tanneries
Cement mills	Fruit evaporators	Plaster	Terra cotta
Chemical plants	Galvanized metal	Power plants	Tipple
Cisterns	Gas holders external use	Protection against acids and fumes	Train sheds
Coal breakers	Gas tanks external use	Protection against brine and salt water	Tugs
Coal bunkers	Greenhouses	Protection against soil conditions	Tunnels
Coke plants	Gymnasiums	Protective coatings	Turbine pits
Concrete pipes	Hospitals	(a) on concrete surfaces to prevent disintegration	Vats
Concrete structures all types	Ice cream plants	(b) on metal surfaces to prevent corrosion	Sewage disposal plants
Condensers	Industrial plants		Sewer pipe
Cooling towers	Light shafts		Ship bottoms
Corrosion protection	Mastics		Silos
Dairies	Meat packers		Slaughter houses
	Metallic piling		Smelting plants
<b>Protection against Gases and Fumes</b>			
Bleacheries	Explosives plants	Pipe covering	Soil acids and alkalies
Bridges, railroad	Fertilizer plants	Pipe lines	Stand pipes
Chemical plants	Foundries	metal and concrete	Steel in storage
Coke plants	Galvanized metal	Rayon plants	Smelting plants
Concrete pipes	Nitrating plants	Refining plants	Steel mills
Electro-plating plants	Ore reduction plants	Round houses	Storage battery
			plants
			Structural steel

**Protection against Corrosion**

Battery box coating	Electro-plating plants	Ice cream plants	Refining plants	Steel mills
Bleacheries	Explosives plants	Industrial plants	Refrigerating plants	Structural steel
Bridges	Fertilizer plants	Meat packing plants	Round houses	Sugar refineries
Chemical plants	Foundries	Metallic piling	Salt plants	Tanks
Coal breakers	Fruit canneries	Packing plants	Ship bottoms	Tanneries
Coke plants	Fruit evaporators	Piers	Slaughter houses	Vaults
Cooling towers	Galvanized metal	Pipe lines	Smelting plants	Vegetable packing
Dairies	Gas holders, external use	gas and oil	Stand pipes	plants
Dye houses	Gas tanks, external use	Power plants	Steel in storage	

**Acid and Alkali Proofing**

Battery box coating	Explosives plants	Packing plants	Salt plants	Structural steel
Bleacheries	Fertilizer plants	Paper mills	Sewage disposal	Sugar refineries
Chemical plants	Fruit canneries	Pickling of metals	plants	Tanks
Coal breakers	Fruit evaporators	Pipe coverings	Sewer lines	Tipples
Coal bunkers	Galvanized metal	Pipe lines	Silos	Train sheds
Coke plants	Industrial plants	metal and concrete	Slaughter houses	Tunnels
Concrete pipes	Meat packing plants	Pulp mills	Smelting plants	Vats
Cooling towers	Molasses plants	Rayon plants	Soap plants	Vaults
Dye houses	Nitrating plants	Refining plants	Steel in storage	Vegetable packing
Electro-plating plants	Ore reduction plants	Refrigerating plants	Storage battery plants	plants

**Protection against Brine or Salt Water**

Abutments	Concrete structures	Packing plants	Sea walls	Tugs
Barges	Cooling towers	Piers	Sewer pipe	Tunnels
Boat decks	Dairies	Pipe covering	Ship bottoms	Vats
Bridges	Floors	Pipe lines	Silos	Vaults
concrete and metal work	Galvanized metal	metal and concrete	Slaughter houses	Vegetable packing
Brine tanks	Ice cream plants	Protection of heat	Steel in storage	plants
Canneries	Industrial plants	insulation	Structural steel	Wood piling
Concrete pipes	Meat packing plants	Refrigerating plants	Swimming pools	
	Metallic piling	Salt plants	Tanks	

**Protection against Soil Conditions**

Abutments	Buildings	Foundations	Pipe lines, gas and oil	Subways
Aqueducts	Cisterns	Galvanized metal	metal or concrete	Tanks
Basements	Concrete pipes	Metallic piling	Protection of heat	Tunnels
Boiler pits	Concrete structures	Mortar	insulation	Turbine pits
Bridges, concrete and metal work	Elevator pits	Piers	Sewer pipe	Vaults
	Fence posts	Pipe coverings	Structural steel	Wood piling

**Protection of Concrete and Masonry against Disintegration**

Abutments	Coal bunkers	Foundations	Ramps	Tanks
Aqueducts	Concrete structures	Freight platforms	Reservoirs	Tunnels
Basements	all types	Grade crossings	Sea walls	Turbine pits
Boiler pits	Dams	Light shafts	Sewer pipe	Vats
Bridges concrete	Driveways	Parapet walls	Silos	Vaults
Buildings	Elevator pits	Penstocks	Subways	Viaducts
Cisterns	Fence posts	Piers	Sumps	Wheel pits
	Flooring	Pipe lines, concrete	Swimming pools	

**Plaster Bond.** For internal walls, external walls, plaster, mortar and stucco

**Construction and Maintenance of Traffic-bearing Surfaces**

Airport aprons	Driveways	Highways	Ry. grade crossings	Ramps
Airport driveways	Freight yard drives	asphalt macadam	Ry. station platforms	Sidewalks
Airport runways	Handball courts	wearing surfaces	Railway walks	Tennis courts
Airport taxiways	Parking spaces	over hard bases	Recreation grounds	Zone markings

*Cold patching, resurfacing, surface treatment, seal coating, mixed method or penetration method*

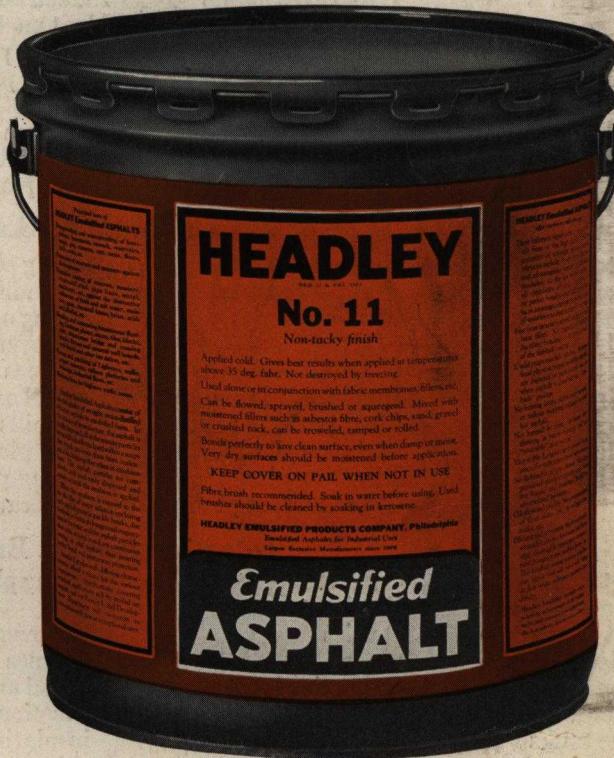
## Headley Emulsified Asphalt No. 11

**H**EADLEY Emulsified Asphalt No. 11, which is recommended as a primer under Headley Asphalt-base Aluminum Coating where an extra heavy residue of asphalt is desirable, consists of straight steam-distilled Mexican asphalt in emulsified form. In the process of manufacture, the asphalt is finely dispersed, all of the minute particles being individually enclosed within a soapy film which prevents them from coalescing or sticking together when in emulsion form. The asphalt particles are completely and uniformly dispersed and remain so until the emulsion is applied.

On application the film of soap solution enclosing each asphalt particle quickly breaks, due to physicochemical changes and evaporation of the water, and the asphalt particles then unite to form a uniform continuous coating of pure asphalt, assuring perfect bond and permanent protection.

The inherent superiority of this material for priming, bonding, waterproofing, etc., comes primarily from (a) the high quality and quantity of straight steam-distilled Mexican asphalt, (b) the small amount and advantageous nature of the soap emulsifier, (c) the low water content, (d) simplicity of cold application, (e) perfect bond to wet and moist surfaces assuring complete protection, (f) resistance to destruction by freezing, and (g) non-reversibility after setting.

Headley Emulsified Asphalt No. 11 can be applied cold and very uniformly by spraying or brushing.



Very dry surfaces should be moistened before application. No heating kettle, skilled workmanship or tedious mopping are required as with hot-applied asphalt.

The coating sets readily, dries in a few hours, and thereafter remains securely bonded, continuous and ductile. It is thoroughly resistant to ordinary temperature changes, water, acids, alkalies, etc., and will not crack, creep or flow under ordinary exposure conditions.

*Shipped in 50-gal. and 30-gal. steel drums and 5-gal. and 1-gal. steel pails.*

## HEADLEY EMULSIFIED PRODUCTS COMPANY

*Emulsified Asphalts for Industrial Uses. Largest Exclusive Manufacturers since 1908*

Franklin Trust Building, Philadelphia

Branch Office: One LaSalle Street Building, Chicago

Works: Marcus Hook, Pa.



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